

## Abstract

Objects of the present invention are to provide a piezoelectric ceramic composition which contains substantially no lead, which exhibits excellent piezoelectric characteristics, and which has high heat durability; and to provide a piezoelectric element including the composition.

The piezoelectric ceramic composition contains M1 (a divalent metallic element, or a metallic element combination formally equivalent to a divalent metallic element); M2 (a tetravalent metallic element, or a metallic element combination formally equivalent to a tetravalent metallic element); and M3 (a metallic element of a sintering aid component), wherein, when these metallic elements constitute the formula  $[(1/2)aK_2O - (1/2)bNa_2O - cM1O - (1/2)dNb_2O_5 - eM2O_2]$ , a, b, c, d, and e in the formula satisfy the following relations:  $0 < a < 0.5$ ,  $0 < b < 0.5$ ,  $0 < c < 0.11$ ,  $0.4 < d < 0.56$ ,  $0 < e < 0.12$ ,  $0.4 < a + b + c \leq 0.5$ , and  $a + b + c + d + e = 1$ ; and when the total amount of K, Na, Nb, M1, and M2 as reduced to corresponding oxides is 100 parts by mass, the amount of M3 as reduced to M3 oxide is 5 parts by mass or less. The piezoelectric element includes a piezoelectric member formed of the piezoelectric ceramic composition; and a pair of electrodes which are in contact with the piezoelectric member.